A GAME-THEORETIC APPROACH TO PUBLIC GOODS, PUBLIC PROJECTS, EXTERNALITIES AND ECONOMIC GEOGRAPHY

ABBREVATED: PUBLIC PROJECTS AND EXTERNALITIES

NES RESEARCH PROJECT FOR 2007/2008 ACADEMIC YEAR

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General description of the project

Some of the major problems facing every nation concern the equitable and efficient provision of a wide variety of public products and services which goes from kid and aged care, different kind of social protections, health services, schools, roads, sport, cultural and recreational facilities to transport infrastructures, high level education and research expenditures. The extent of their domain, the form that their provision should take are essentially political questions, shared by all countries in the world.

Defining public policies on these questions is however a core challenge to a policy-maker. Historically different national policies pursued by different countries with differences in preferences and priorities may make the problem especially acute. Labour mobility across countries, tax competition all bring new needs and new difficulties for constructing appropriate responses. Rather than a political answer, our project aims to advance the part of economic theory addressing these crucial issues, keeping in mind historical and political considerations.

Literature overview and research plans of the project

The intended object of our analysis is far from being the whole domain of public economics. The programme is confined to issues of pure public goods and public projects, all kind of impure public goods, in particular local public goods (with different theoretical implications according to the assumption that location is undergone or chosen), public goods as production inputs, public projects, externalities, especially environmental externalities.

Approaches and tools include general equilibrium and welfare analysis, decision and game theories, public choice theory, asymmetric information, theory of incentives and mechanism design, and experimental approaches.

The following research directions could be pursued within the project:

- General equilibrium with public goods

- Lindahlian approaches to equilibrium and optimality

- Regulation of the production of public goods

- Public goods, redistribution, taxation and tax competition

- Public goods as factors of production

- Local public goods and multi-jurisdictional economies

- Externalities and sub-optimality of equilibrium

- Environment and effects of tradable emission permits

Of course these questions could be — actually, have been — studied from other perspectives and using different methodologies in other social sciences. We plan to compare our results with those in other disciplines. This project partially builds upon the progresses made in

the related fields such as Economic geography and fiscal federalism. And the key feature lying in the base of all issues around policy-making is the diversity of characteristics within one and the same nation.

For European Union, Russia, India and China, one of the major characteristics in which regions differ from each other is language. The challenge of linguistic diversity has been, and still is, one of the most intense and troublesome issues in multilingual societies. A linguistically diversified society that limits the usage of some of its languages would necessarily disenfranchise the individuals who speak them. On the other hand, the introduction of excessively large set of official languages could put a heavy financial burden and be detrimental for purposes of communication within and outside of the society institutions.

Thus, the society, like the European Union, has to weigh the costs of sustaining a large number of official languages versus its own tolerance of disenfranchisement of some of its members. In (Ginsburgh and Weber 2003, Fidrmuc et al. 2004) there have been conducted empirical studies of language disenfranchisement by using the survey and population data on language proficiency in the European Union. The analysis of language disenfranchisement has been extended in (Ginsburgh et al. 2004a), by utilizing the percentage cognate Dyen matrix of linguistic distances between Indo-European languages (Dyen et al. 1992) that takes into account the linguistic pairwise proximity between languages. The natural way to tackle the language disenfranchisement and lack of ability to communicate in relevant languages is the study of foreign languages.

This problem can be related to the problem of network externalities: since the welfare of an individual raises with the number of people he or she can communicate, then the larger the number of speakers of a foreign language, the more attractive is the prospect of acquiring it by non-speakers. Obviously, this benefit has to be contrasted with the cost of learning another language, which depends on the linguistic proximity between the native language of an individual and the language to be acquired, see (Ginsburgh et al. 2004b).

Theoretical foundations

Now we see a rising interest to operations on jurisdictions as among theoreticians (Alesina and Spolaore 1997, Bogomolnaia et al 2005, 2005a, 2006, 2006a) and among practitioners as well. Russian Federation is under the total reform of local self governance. And at the same time there is academic and public discussion about Federal Constitutional structure of Russia. See for example, (Юрьев 2004). In practice, there was a merger of the two subjects of Russian Federation (Perm oblast and Comi national district), and several other mergers are on the agenda (starting with the unification of Krasnoyarsk Krai with two national districts). A general problem is a big uncertainty in the rules of jurisdictions' creations and liquidations. The process of new states' formation, unifications and so on is increasing in the world last decades. At the same time, more or less precise rules governing this process, which could have been acknowledged by international community, are absent. A practical experience is accumulated gradually, and theoretical people have to contribute in the field as well.

Another part of the research project analyses theoretical aspects of group formation with heterogeneous individuals, where the intra-heterogeneity of the group is not only crucial for the group itself, but also creates externalities for non-members. It is possible that these group or network effects induce asymmetric equilibrium outcomes even in models

with symmetric agents, an aspect which was largely ignored by the existing literature on the topic. Our theoretical investigations will use the framework of (i) cooperative games in partition function form à la Aumann-Drèze; (ii) non-cooperative simultaneous games, including potential games; and (iii) models with farsighted view of coalition formation.

Third, we address the issue of optimal size and composition of nations and blocks. In order to mitigate a threat of secession by dissatisfied regions, the central government may implement various compensation and redistribution transfer schemes, and we plan to examine, both theoretically and empirically, whether the degree of redistribution is positively correlated with the level of income inequality and regional disparities within the country. We plan to conduct a theoretical and empirical analysis of country formation by allowing an endogenous degree of redistribution, which is consistent with the preferences of the majority of citizens.

Applications

Linguistic diversity

As is shown by empirical studies of the language disenfranchisement in the EU, a society has to weigh the costs of sustaining a large number of official languages versus its own tolerance of disenfranchisement of some of its members. It is natural to examine the language issues in the context of network externalities mentioned above; second challenge is to work out indices of linguistic divergency, and to apply them to various multilingual countries, e.g. Russia, India, China, and the European Union.

Spatial heterogeneity

Location is one of the main facets of heterogeneity across the population of economic agents. It is fair to say that almost all models focus either on two regions or on a symmetric multi-regional setting that ignores most of heterogeneity aspects within countries. We plan to examine, both theoretically and empirically, the impact of location and income distributions in an asymmetric multi-regional setting.

Another important facet of the space-economy is a heterogeneous size of the cities that is manifested by the coexistence of large and small cities, even in the case of ex ante identical individuals. By using the Christaller and Lösch approach, we plan to extend the two-sector two-city model of the interaction between urban hierarchy and the level of transport costs of different goods to an arbitrary number of sectors and cities. We also plan to address the redistribution issues in environments with multidimensional citizens' characteristics (income, location, political preferences, etc).

Possible titles of Master's Thesis

In this section, we offer several possible topics for Master's Thesis. Students are by no means restricted to this list; any questions concerning contents of these topics could be addressed by an e-mail via `hibiny@mail.ru and savvateev@gmail.com` to Alexei Savvateev.

1. Policy towards safety on the roads: does "autograzhdanka" a good job?

2. Cost sharing and equalization: a study of the Russian case

3. Mergers of subjects of the Russian Federation: theory and practice

4. Distribution of voting power in electoral bodies

5. Analysis of hierarchical structure of municipalities in a federation

6. Indices of horizontal diversity of regions in Russia: theory and empirics

7. Optimal linguistic policies in multi-national organizations

8. Indices of linguistic diversity: examples of Russia, China and India

9. An analysis of constitutional rules of secession: theoretical investigation and overview

10. Stability and migration in different institutional settings

11. Cost sharing and equalization: a study of the European Union

12. Regional non-monetary privileges in the Russian federation

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